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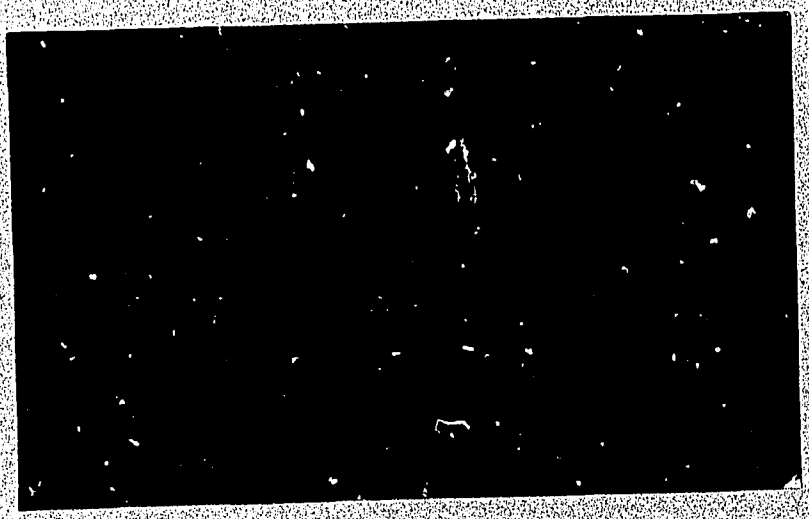
ABSTRACT

This document deals with the Images component of the Modular Achievement Program (MAP) at Bowling Green State University. The component was designed to organize, evaluate and utilize an understanding of the world. The program is described in relation to history and time constraints, goals, students, faculty, implementation and assumptions, general recommendations, administrative duties and recommendations, and evaluative research. Appendices cover teaching materials and a sample syllabi. Related documents concerning the various aspects of the MAP program include HE 005 102, 005 083, 005 078, 005 082, 005 081, 005 080, 005, 077, and 005 079. (MJM)



Modular Achievement Program / Bowling Green State University

The Third Year of The First Little College

"Images"

Fall, 1972

Douglas D. Daye
M. Neil Browne
September, 1973

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I. Introduction

1972-73 brought two major changes in the Little College. First of all, the program added an 8-hour Communications Module; and, secondly, it became part of the newly-created Modular Achievement Program. This report deals specifically with the Little College "Images" component.

The 1972-73 "Images" faculty consisted of nine regular faculty members and one individual who had faculty status. This group was recruited during June-July of 1972 and together constituted the Images faculty for the third year of the Little College's history. It began with a spirit of optimism and continued the process of redefining the content and techniques of teaching cognitive skills to first quarter freshmen. With the advent of the Carnegie Corporation grant to the university and the inclusion of the Little College under the MAP administrative umbrella, the 1972-73 Images program advanced significantly in the areas of innovative program development, administrative organization, innovative pedagogical techniques and post-quarter evaluation results.

However, during the seven months from July 72 to January 73 in which the Images faculty was most active, it was evident that there were operative several pedagogical directions, philosophical presuppositions, and teaching life styles coupled concomitantly with the understandable disciplinary view points of individuals from eight different departments. Those individuals with previous experience in such a course brought their experience to bear on this year's problems; the result was a better course than in the previous year. However, no human affair is without its share of problems. Several of the latter are discussed below.

II. History and Time Constraints

One crucial feature of the "Images" program was the severe time constraints under which the new organizational structures were devised and implemented. During June of 1972, Drs. Neil Browne and Douglas Daye were asked to assume Co-Directorship and to recruit suitable faculty members for the Images component of the Little College program. Within a period of six weeks, three members of the previous year's program had been contacted and recruited and five new members had been selected and had made their commitment to the program. There were a number of long fruitful meetings during the remaining summer months of 1972. At this time, pedagogical techniques and viewpoints were exchanged and generally agreed upon. Textbooks and teaching materials were selected, and valiant attempts were made to achieve consensus on both techniques and goals. Evaluative materials such as the Watson-Glaser test were selected and ordered.

Additionally, Browne and Daye were charged with the responsibility of gathering their new faculty members and presenting a formal exposition of MAP to the parents and students registering during the summer. A

desk at registration in the Student Service Building was manned by faculty members in order to explain questions concerning MAP. Approximately an hour's exposition of the program, its expectations and student responsibilities, was presented to all interested parties during each of the four days of registration in the four week period. Vacations, dissertations, and summer school courses were all sandwiched in this rather frenetic scheduling. Since there was a strong emphasis on those aspects of the course which had absolute priority, such as cognitive goals, their implementation and course materials, there was no time to work out many of the administrative details and responsibilities which later came to plague us in one way or another.

In September, faculty members of the various MAP components and interested parties met for two days at Pokagon to discuss the interrelationships within their various components and the wider issues of the interrelationships of the components in MAP. Again pedagogical techniques and viewpoints were aired and there was a very strong attempt to formulate and discuss an overview of the various components of MAP and the interrelationships and implications of the total program for the larger university.

In September, the program was implemented and the ten faculty members of "Images" met their classes regularly. Some details concerning the history of the actual implementation of "Images" may be found in the descriptions which follow and in the appendices.

III. Goals

Below is a descriptive list of the goals generated by the "Images" faculty during the late summer of 1972.

Starting with the assumption that "evaluation" in this situation means "a measure of progress toward specific goals," we have begun our work by stipulating what seem to us to be among the goals which ought to be shared by all sections of the course. This list is not exhaustive. The goals are merely further specification of goals implied by our initial three-stage outline of the course. The goal statements are organized roughly according to that outline. This is the outline:

I. How we arrive at and organize our understandings of the world.
II. How we evaluate our understanding of the world.
III. How we use our understanding of the world to reach further understandings.

We have divided the goals into SKILLS and ORIENTATIONS. They are really different aspects of the same basic work; but the different aspects may require different pedagogical approaches, so they seem worth itemizing.

One attitude seemed to us so fundamental that it should precede the outline proper: We should encourage belief in the need to pursue personal growth through the development of intellectual skills by means of academic studies, (i.e. a belief that vigorous engagement with the University's academic programs is worth the trouble.) We should aim to overcome the common disbelief in the relevance and pragmatic value of intellectuality (or rationality) and the efficacy of curricular academic work in its pursuit.

ATTITUDES/ORIENTATIONS: We should encourage:

1. a realistic relationship to the "world outside," based on an understanding of the effects of the perceptual system and the conceptual system on our thinking.

2. commitment to a constant battle to become more Accommodating and less Assimilative (i.e. to struggle to process our experience as open-mindedly as possible, imposing our previous epperience on new experience as little as possible).

3. commitment to constant re-evaluation of our Unwelt and our "rules of the road."

4. respect for all styles of thought (i.e. rational, intuitive, and emotive) based on an understanding of the potential productive functions of each.

5. respect for evidence.

6. a problem-solving attitude (i.e. the tendency to see difficulties as problems to be sorted out and solved by methodical means).

7. tolerance for deferred judgment.

8. tolerance for non-closure.

9. tolerance for ambiguity.

etc.

SKILLS: We should develop skills in:

1. Control of the Level of Conceptual Abstraction (the ability to distinguish linguistic disagreements from real ones, to recognize the apt and functional levels in a situation, and to operate at a rationally selected level).

2. Analysis: Classification, Structure Analysis, Operation Analysis (i.e. general skill in the productive manipulation of information).

3. Analogical thought: skill in comprehension, construction, and use of analogies, from the perceptual/image-making level, through linguistic analogy, to modeling and simulation.

4. Logic: Deductive and Inductive, including the ability to organize and evaluate evidence, to recognize the status of different sorts of evidence, and to draw reasonable inferences.

5. Convergent Thinking: the process of seeking and recognizing "the appropriate answer."

6. Divergent Thinking: the process of conceiving alternatives in quantity.

IV. Students

During the summer, two hundred students were recruited from the entering freshman class. One unique element of the recruitment process during 1972 was added by the inclusion of the Little College program within the Modular Achievement Program. Thus, students were recruited into MAP with the understanding that their first quarter experience in MAP would be thirteen credit hours in the Little College. They were assured that they were committing themselves to MAP for the fall quarter only.

One of the primary problems of the 1971 Little College was the misunderstanding among students concerning the objectives of our program. In an attempt to avoid this problem in 1972, the faculty were involved heavily in the recruitment process. Each day during preregistration, the "Images" faculty met with prospective students and their parents and discussed the nature of MAP components, especially the Little College. However, despite our efforts, students were still confused during the fall quarter about our purposes and how we were going to implement them. The primary responsibility for this confusion rests in the somewhat distinct objectives of the Images faculty and the MAP project. Despite our attempts to dissuade them, our students were captivated by the idea of a three-year degree. The goals of the Images faculty were more limited and some students were thus less impressed by our attempts to achieve them. In addition, public relations releases from the university speaking of a "three-year degree" and the "highly successful" MAP Project caused students to (1) ask why they had been told that a three-year degree was a very slight possibility and (2) doubt the judgement of Images instructors who were assigning some of them grades of "C" and "D."

Another problem which involved our students was their seeming reluctance to take pride in their work and their unwillingness to engage in the quantity and quality of work which some Images instructors expected. Perhaps experimental programs such as ours must struggle to overcome the common student perception of experimental courses as easy or loosely structured. Special efforts should be made in the future to inform our students that "relevant discussions" and "student-centered learning" are not synonymous with "rap sessions."

V. Faculty

Five of the ten had experience from previous Images courses and five were asked to teach Images for the first time. Each faculty member was offered the opportunity to contribute to the formulation of course goals, choice of curriculum materials, and determination of course structure. The only restrictions imposed on the group by MAP were that the course should be process-oriented, student-centered, and focus on the general area of cognitive skills. Throughout the summer the faculty met to plan program objectives and structure.

As a direct result of the method used for faculty recruitment several problems arose. In the words of one faculty member, "If we made one mistake it was an attempt to coordinate a program which meant something very different to each faculty member." This problem of several different Images sections being offered under one rubric reappeared from previous years. In anticipation of this problem the faculty created a list of goals which were more explicit than any utilized by prior Images faculties. However, we failed to recognize until it was too late that additional structure was necessary to maintain the integrity of Images. Our list of goals for Images '72 was too inclusive and open to too many possible interpretations. Thus, techniques and goals were too diverse (1) to stimulate desirable levels of faculty development and (2) to permit an optimal setting for evaluation.

Another related problem was the involvement of new faculty members in the choice of curriculum materials and program evaluation instruments prior to their attainment of an adequate understanding of student needs in the area of cognitive skills. One faculty member asserted that such decisions "must be made by individuals who have a clear understanding of what is going on." New faculty members were put in a position of having to make major decisions in a state of relative ignorance and without time to assess fully possible alternatives.

One of the weaknesses recognized by previous Images faculties was inadequate opportunities provided for faculty sharing of techniques. We improved performance in this area but faculty development was still minimal. Weekly two-hour meetings were held throughout the fall quarter. However, we wasted too much time wondering aimlessly, exploring the need for greater coordination between Images' goals and MAP goals, or discussing administrative minutiae. Each of the Images faculty recognizes the need for more tightly structured agendas and programs for faculty growth.

VI. Assumptions and Implementations

This year's Images program, when compared to last year's program, possessed an articulated structure much superior to the previous year. There were essentially two groups whose predilections were reflected in the goals for this year's Images. The goals of the first group can be designated by the rubric "critical thinking"; this includes the study of inference, recognition of assumptions, deduction, interpretation

of evidence, and the evaluation of formal arguments. These goals were measured by the Watson-Glaser Critical Thinking Appraisal. As noted in the description of the goals, the Images faculty hoped to modify students' attitude toward the usual academic skills; such changes in attitudes toward academic skills were evaluated by the Omnibus Personality Inventory.

The second group may be designated as the "heuristic thinking" group. This group was concerned with the generation of alternate ways of problem-solving, "divergent" thinking, "convergent" thinking, and analogical thought. These emphases were measured by the Torrance Tests of Creativity, the Remote Associates test, and a specially constructed analogy test which included verbal and visual analogies. The second group essentially followed the thrust of one member of the faculty; however several of the faculty members made strong attempts to understand and to gain experience in this particular pedagogical viewpoint. A commitment was made on the part of all faculty to include class experiences which would prepare a student in all of these areas of cognitive skills. One interpretation of the quarter on the part of a bare majority of the faculty members suggests that it is impossible, within a ten week period, to implement all of these goals with the necessary depth to enable the students to achieve any significant degree of proficiency in all of these skills. Those of the first group suggest that the heuristic aspects be greatly deemphasized and that emphasis be put upon an exposition and practice in those critical thinking cognitive skills so that the students achieve a depth of understanding and a level of performance not possible with the inclusion of the heuristic aspects. It is also safe to say that the faculty impression is that the students need much more practice in critical thinking cognitive skills than is generally realized. Heuristic thinking, not being an axiomatic body of knowledge, was also relatively unfamiliar - as a disciplined body of knowledge - to most of the faculty members. Claims to its superiority and calls for "evidence" in light of the performance and the demonstrated significance left most faculty members unconvinced. This is not to say that heuristic thinking is undesirable; it is most desirable; but as a technique to be included in a ten-week course it seems to add too much to an already weighty curriculum.

Faculty and student comments coincided in their criticisms and suggestions about the use of the curriculum materials used. The pamphlet Communications by Fabun was considered too elementary and too sketchy. De Bono's book Newthink was the major source of heuristics adopted by the group. Most people found it a relatively interesting book but one which was terribly inflated and could have been summarized in one solid chapter. In all fairness, one must add that without specific practice in these heuristic skills, one's reading about it will not suffice. The Greening of America by Riech was more successful in the hands of some than in the hands of others. Some found it too dated and verbose; others found it to be a very useful stimulus book with which to provoke attack and develop critical skills on the part of students. The "Advocates" films used by some members of the Images faculty were successful; some others

felt that they were used too often. Other successful stimulus books were Huff's How to Lie with Statistics and Sexual Latitudes: For and Against. The two latter works were optional books used by different faculty, as was W. Quine's The Web of Belief. All members used Purtill's Logical Thinking; this was viewed by some as less successful than last year's book The Art of Making Sense by Ruby. The general impression from the faculty is that perhaps too many source materials were used and that the number of curriculum options should be somewhat diminished. This is not to say that we do not want to leave room for an option or two in the selection of stimulus material to be used by particular individuals who feel at home with a particular book or who have been successful with it in the past, but rather that the range of core materials to be used by every individual faculty member in the course should be greater than it has been in the past.

VII. General Recommendations

We suggest the following recommendations:

1. The name of the course should be changed to "The Art of Making Sense," a title more descriptive of the actual objectives of the course.

2. We need not integrate our efforts with Speech 102. Given the present structure of Speech 102, we are unable to see much merit in attempting to interrelate the two courses. We are basing our recommendation on our unanimous assessment of the failure of our integration attempts in the 1972 Little College.

3. Future cognitive skills courses should have fewer goals, more simply defined. "The Art of Making Sense" (AMAS) should concentrate on a few goals which can be explicitly identified. Our experience of the past year has indicated that attempts to master many goals dilute efforts in any specific area and, consequently, make the evaluation of the course more difficult. By emphasizing fewer goals the course can gain a more definite purpose and will permit more meaningful evaluation.

4. AMAS should emphasize those critical and evaluative skills which improve problem-solving and the generation of alternative hypotheses. Experience of the past year suggests that emphasis on heuristic skills prior to the mastery of the above skills was neither productive nor did it meet the primary needs of our students. Within a ten-week period we do not believe it possible to achieve a desirable degree of competence in critical and evaluative skills while attempting to teach other skills.

5. We recommend that the weekly faculty meetings in the fall quarter be more tightly structured than they have been in previous years. Most of us in the 1972 "Images" faculty were unhappy with the quality of our weekly meetings. Instead of leading to heightened faculty development, they frequently focused on administrative detail concerning the MAP Project. Hence we suggest (a) handling of administrative detail by memo, (b) concentrated efforts to share techniques and insights concerning specific course objectives for the following week, (c) precise agendas, (d) rotation among our colleagues of primary responsibility for leading the weekly discussions.

6. One major difficulty encountered in the effort to coordinate among the Images faculty was that, although there was general agreement as to the over-all goals of the course, there was little agreement as to the timing and order of their implementation. As a result, faculty were rarely covering the same subject areas simultaneously and coordination was not often possible. In addition, advantages of discussions among students in different sections were lost and it was difficult for them to perceive the course as a unified effort. It is therefore recommended that in addition to the establishment of a set of goals, the faculty should develop a course syllabus which will outline with sufficient detail the progression of the course. While this syllabus should be loose enough to allow for individual creativity it should be restrictive enough so that at any one time the same course areas will be covered in each section of the course. We suggest that the course outline be segmented into divisions of from 2-4 classroom sessions.

7. In reviewing the reading materials used in the Images course, we felt that they were too varied both in terms of quality and content. With regard to content there was no orderly progression of materials in terms of either theme or rigor. We recommend that materials be selected so that the course will proceed in a systematic way from the introduction and discussion of simple ideas, arguments and points of view, to the discussion of complex subjects. If possible, the course should conclude with a monograph which will bring together many of the concerns and techniques previously covered.

8. Every effort should be made in the selection of course materials to insure that they be not only "relevant" but also significant to the student in the development of his/her personal values. The requirement that students be continually challenged with respect to their perceptions, points of view and actions and that they be forced to evaluate various alternative solutions to social issues is a parallel goal to the development of critical thinking skills. Indeed the two are inseparable.

9. We should explore the possibility of several joint papers with English 111/112. During the fall quarter of 1972 several attempts to have Images and English instructors work together to evaluate student papers produced results that suggest that further efforts of this type may be fruitful. Such an approach would emphasize that the student should not compartmentalize his skills, a tendency that was all too evident during our 1972 experience. A format that would allow for several rewrites of student papers would emphasize learning from one's mistakes.

VIII. Administrative Duties and Faculty Responsibilities

No unambiguous explicit statement of the responsibilities and duties of the Co-Directors was ever formulated during the period of last quarter's Little College. We had no budget, and no clear-cut mandate such that the Co-Directors felt that they had the authority to make any but the minor

decisions in the day-to-day operation of the program; they clearly had no authority to criticize faculty members who were clearly not fulfilling their responsibilities. Recommendations to remedy this situation follow shortly. Faculty participation during the summer was good; faculty participation during the weekly meetings of the fall quarter was good on the part of most but spotty and unproductive among a few. Sub-committee responsibilities were sometimes carried out with great enthusiasm and devotion; sometimes such activities were obviously given a very low priority.

A. Responsibilities of AMAS faculty members

The following responsibilities should be included in the agreement signed by each faculty member, where appropriate. Inclusion of responsibilities in the agreement should prevent misunderstandings between program administrators and faculty members concerning division of tasks within the program.

1. Participation in the planning of curriculum, course objectives, and syllabi.

2. Individual contribution to general planning sessions following faculty recruitment.

3. Sharing pedagogical assumptions and techniques at faculty training sessions.

4. Attendance at and contributions to weekly fall faculty meetings.

5. Performance of committee assignements.

6. Post-course evaluation reports.

7. Participation in the post-course workshop.

8. Participation in summer and/or fall MAP orientation sessions for students.

9. Preparation for individual course section in Fall Quarter.

10. Any social obligations which the faculty agrees would enhance academic objectives.

11. Advising MAP students.

B. Responsibilities of the Directors of the "AMAS" Program

These responsibilities do not include those which the directors may fulfill as regular faculty members within AMAS. Instead, this list delineates only those obligations which will be unique to the directors.

1. Organization and planning of budget, agendas, faculty responsibilities, and administrative responsibilities.

2. Interaction and coordination of the AMAS course with the other program directors.

3. Regular communication with the director of MAP and the other program directors.

4. Organization of faculty recruitment.

5. Completion of post-course evaluation of the AMAS course.

6. Evaluation of AMAS faculty members.

7. Contribution to the planning of orientation for MAP students.

8. Representing the Little College at university meetings, e.g. college advisors and teaching workshops.

9. Communication with the AMAS faculty concerning developments in MAP.

10. Assorted administrative tasks, e.g. room schedules, ordering curriculum materials, and responding to any student problems associated with our program.

IX. Evaluative Research*

In order to investigate the effects of the Images course, a standard experimental design was used called a Pretest-Postest Control Group Design, with the subjects in the control group and in the experimental group constituting matched pairs. The experimental treatment was to be the 5 credit-hour Images course offered in Fall Quarter, 1972.

Since the Images faculty has proposed a multiplicity of goals delineated earlier in this report, it was clearly impossible to test for student achievement in all of the areas covered in the course if students were to do anything but take tests. The faculty then agreed to adopt a set of five measures which would cover a broad range of activities in the course. These measures were to be chosen on the basis of their relevance to the goals of the course, a reasonable degree of standardization, and their previous usefulness on a college level according to the literature. While four of the measurements were available commercially, the fifth was developed by the faculty itself due to the lack of such an instrument in the marketplace.

The measures chosen (and the area they intended to measure) are the following: Watson-Glaser Appraisal of Critical Thinking (critical thinking skills); Omnibus Personality Inventory (intellectual orientation); Remote Associates Test (convergent thinking); Torrance Tests of Creative Thinking (divergent thinking) and ANALOGY (thinking by analogy). For the interested reader these tests and measurements are explained more fully on the following page. Even more complete explanations and technical details of the instruments are available in the MAP Office upon request.

Subjects

The 198 students in the experimental group were in the Modular Achievement Program during the Fall Quarter. ACT composite scores for MAP students indicated they had a somewhat higher than average ability to do college work in relation to the average Bowling Green freshman.[1]

The control group which was called the Freshman Experience Project (FEP) was recruited before the start of the Fall Quarter. 198 incoming freshman who had been matched with students in MAP on the basis of sex, college, high school decile, and ACT composite were sent letters asking them to participate in the group as a service to the university and were

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* This section of the report was written by James L. Litwin, Assistant to the Director of MAP for Development and Evaluation.

[1] The ACT composite score group mean for MAP was 22.8. The same score for students in the control group was 24.3. The score for all BGSU incoming freshmen was 21.8. The standard error of measurement for the ACT composite score is 1.

Tests and Measurements

1. Watson-Glaser Critical Thinking Appraisal

The Watson-Glaser is a test requiring the application of important abilities involved in critical thinking. The test draws items from five different areas associated with critical thinking: inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments. Forms Z and Y were administered.

2. Omnibus Personality Inventory (Form F)

The OPI was constructed to assess selected attitudes, values and interests of students. The fourteen scales used in the Inventory were chosen either for their particular relevance to academic activity or for their general importance in understanding students in an educational context. The first four scales in the OPI were used to construct an "intellectual orientation" dimension in order to measure students' general orientation to intellectual activities.

3. Remote Associates Test

The Remote Associates is a test of convergent thinking, the process of seeking and recognizing "the appropriate answer." Form A was utilized in the construction of two smaller versions of the test.

4. Torrance Tests of Creative Thinking

The Torrance Tests provide seven activities by which to measure creative thinking. The ability to be fluent, flexible, and original in responding to these items is generally the measure utilized. Activities 5 and 6 in Verbal Forms A and B were administered.

5. ANALOGY

A developmental instrument, ANALOGY is comprised of two types of analogies: verbal and visual. The student's task is to complete the analogy. Items for two forms of the test were drawn at random from books which cited examples of analogies.

also offered a five-dollar incentive. One hundred of these students showed up at the two pre-test sessions. An analysis of the mean score on the ACT composite of these students showed they also had a better than average score in relation to the BGSU norm, and also higher than the mean score for MAP students.

Of the 100 students in the control group who took the pre-tests, 71 chose to take the post-tests. These 71 represented 36% of the original group of 198 which had been contacted.

While the FEP group was continually diminished in number, it retained its characteristic of high academic ability as an analysis of Fall grade point averages showed. The students in the control group had an average GPA of 3.03; the students in the experimental group had an average of 2.81. Both of these groups had a relatively high GPA when compared to the all-university freshmen GPA of 2.59.

Procedure

Students in the experimental group (MAP) and in the control group (FEP) were asked to complete the pretests during orientation week and the posttests during final exams week. In each instance they were given a number of times in which they could take the tests.

Neither in MAP nor in FEP were test results used for grading purposes. Students in MAP were "required" to take the tests, while students in FEP volunteered. While most students found the process to be too lengthy, most also felt the tests were "interesting," especially in regard to the Omnibus Personality Inventory (OPI).

During the 9 week interim period, students in FEP took regular college courses, presumably in line with their interests and the advice of their college advisors. Students in MAP participated in the Images course, the Communications Module (English and Speech), and in one other course, usually related to their major or a prerequisite.

Data Analysis

Two basic methods were used to analyze the data: simple data description and analysis of covariance.

Since scores on the ACT composite and pretests were available, it seemed that an appropriate analytical tool to use was analysis of covariance which tests for significant differences in group means after they have been adjusted to take into account initial differences between the groups. In this case, the students' ACT composite scores and scores on the pretests were used as covariates.

Findings

Student Performance in both MAP and FEP are reported in this section under each of five areas delineated as goals by the Images faculty. When necessary, a more lucid explanation is used to describe the measurement per se. It should be pointed out that the N varies between the tests because only students who took both the pre-test and the post-test were used in each analysis; this variation occurred most often when a student was unable to attend one of the post-test sessions.

Critical Thinking Skills

The results of the Watson-Glaser are reported in Table 1. They would indicate that there was a greater increase in the mean score of the experimental group (MAP) than the control group (FEP). This difference proved to be significant using analysis of covariance.

TABLE 1: RESULTS OF WATSON-GLASER

	MAP (N=187)		FEP (N=64)	
	Pre	Post	Pre	Post
MEAN	67.34	69.39	66.12	66.93
ADJUSTED MEAN		69.26		67.34

F=4.301 (p=.05)

Since the Images course devoted much of its time to critical thinking skills, it seemed worthwhile to investigate the notion that there would be a positive relationship between grades given in the Images course and scores on the Watson-Glaser. This appeared to be the case when it was found that students who scored in the medium and high ranges on the post-tests had considerably higher grades in the course. This positive relationship also proved to be the case when average grade point averages for all courses taken in the Fall quarter were reported. This data is reported in Table 1A.

TABLE 1A: WATSON-GLASER SCORES AND GRADE POINT AVERAGES

W-G SCORES	"IMAGES G.P.A."	FALL G.P.A.
High (74+) N=62	2.80	2.93
Medium (66-73) N=65	2.75	2.70
Low (65 or below) N=60	2.51	2.56

Intellectual Orientations

This measurement was intended to investigate an increase/decrease in a student's general orientation to intellectual activities. Four scales were used to provide a more comprehensive measure: Scale I: Thinking Introversion; Scale II: Theoretical Orientation; Scale III: Estheticism; Scale IV: Complexity. These four scales were drawn from the Omnibus Personality Inventory (Form F) and had been shown to relate to each other under the rubric "intellectual orientations" by previous factor analyses reported in the OPI manual. Each of the four scales provides a measure which is related, yet somewhat distinct from the other measures. These differences can be summarized briefly.

Scale I: Thinking Introversion (TI). Students scoring high on this measure are characterized by a liking for reflective thought and academic activities.

Scale II: Theoretical Orientation (TO). Students who score high on this measure indicate a preference for dealing with theoretical concerns and problems and for using the scientific methods of thinking.

Scale III: Estheticism (Es). High scores endorse statements indicating diverse interests in artistic matters and activities and a high level of sensitivity to esthetic stimulation.

Scale IV: Complexity (Co). This measure reflects an experimental and flexible orientation rather than a fixed way of viewing and organizing phenomena.

These four scales constitute the "Intellectual Orientations" Inventory, the results of which are reported in Table 2 (on the following page).

The data reports mixed results in that two scales (TI and TO) indicate no significant difference and the other two (Es and Co) do report significant differences. While one could argue that the Complexity scale would be the most critical one to examine because of its emphasis on flexibility and experimentation, it also could be pointed out that the Theoretical Orientation scale was extremely important because of its emphasis on logic and analytical thinking.

It should also be noted that students in MAP had higher scores on all four scales at the beginning of the quarter. This would suggest that students who enrolled in MAP were initially more oriented toward intellectual activities than students in the control group. Other research shows that this is not an unusual finding: in general, students in experimental programs choose those programs because they are more interested in intellectual activities.

Thinking by Analogy

As described earlier, ANALOGY, was constructed by putting together a random sample of verbal (20 items) and visual analogies (10 items). While the content validity of the test was self-evident, no other technical analyses of its validity or reliability have been attempted (several members of the Images faculty have indicated a real interest in developing this test, as none exists on the current marketplace; the Miller Analogies Test was thought to be too advanced and lengthy for this purpose). While a significant difference was reported, the actual increases were slight for the MAP students, and there was a slight decrease in the mean score for FEP students. These results are reported in Table 3.

TABLE 3: RESULTS OF ANALOGY

	MAP (N=193)		FEP (N=67)	
	Pre	Post	Pre	Post
MEAN	22.99	23.22	23.45	22.97
ADJUSTED MEAN		23.38		22.54

F=7.854 (p=.01)

TABLE 2: RESULTS OF "INTELLECTUAL ORIENTATIONS" INVENTORY

Scale I: Thinking Introversion	MAP (N=185)		FEP (N=70)	
	Pre	Post	Pre	Post
MEAN	25.10	25.09	21.52	20.97
ADJUSTED MEAN		24.15		23.44
F=0.988 (p=N.S.)				

Scale II: Theoretical Orientation	MAP		FEP	
	Pre	Post	Pre	Post
MEAN	18.89	18.62	16.98	16.17
ADJUSTED MEAN		18.23		17.21
F=2.89 (p=N.S.)				

Scale III: Estheticism	MAP		FEP	
	Pre	Post	Pre	Post
MEAN	13.40	14.63	10.90	11.57
ADJUSTED MEAN		14.08		13.02
F=5.258 (p=.05)				

Scale IV: Complexity	MAP		FEP	
	Pre	Post	Pre	Post
MEAN	17.03	18.57	14.27	14.65
ADJUSTED MEAN		17.91		16.40
F=7.173 (p=.01)				

Convergent Thinking

The ability to come up with the "appropriate answer" was tested by two shortened versions of the Remote Associates Test. The use of these mini-versions is questionable. The publishers of the test felt that the two shortened versions of the test would result in a considerable loss of reliability; no loss of validity was expected. The results are reported in Table 4. Both groups decreased in their ability to perform well on the test; however, MAP students did decrease considerably less than FEP students.

TABLE 4: RESULTS OF REMOTE ASSOCIATES TEST

		MAP (N=189)		FEP (N=64)	
	Pre	Post		Pre	Post
MEAN	8.33	7.10		9.21	6.35
ADJUSTED MEAN		7.22			5.98

F=10.457 (p=.01)

Divergent Thinking

The results of the Torrance Test of Creative Thinking are reported in Table 5. Mean scores only are reported for the Torrance Tests. Further analysis seemed unjustified because of the unforeseen difficulties we encountered with the tests. In short, the notion to use the Torrance Tests proved to be too ambitious and overidealized.

Students were asked to complete activity 5 (unusual uses) and activity 6 (unusual questions) in Verbal Form A and B of the Torrance series. The difficulties began to emerge when we began to code the nearly 500 responses (pre and post-tests). Each single response generated two subsets of responses (one for each activity), and each of these in turn generated approximately 20 answers, all of which needed to be coded into 3 different categories. It did not take too long to get a feeling for the enormity of the task. After considering the investment that would need

to be made for coders, etc., we decided that we would concentrate on activity 5 only and then only on a random sample of those who took the post-test (we had already coded all of the pre-tests). The random sample proved to be similar to the total population on the pre-test scores when we examined scores on the pre-test.

The answers given in the Torrance Tests are coded in three ways: (1) Fluency (a simple count of the number of answers), (2) Flexibility (the number of different types of answers), and (3) Originality (the uniqueness of the answer as recommended by the scoring manual).

The mean scores indicate that MAP students not only were more "creative" at the outset but also increased dramatically in their ability to perform well on the post-test. The change scores for both groups were in positive directions. Such scores on the Originality factor would indicate that all students were twice as creative as they were at the beginning of the quarter.

TABLE 5: RESULTS OF TORRANCE TEST OF CREATIVE THINKING, VERBAL ACTIVITY 5

	MAP			FEP		
	Pre (N=191)	Post* (N=66)	Change	Pre (N=70)	Post* (N=31)	Change
FLUENCY	21.17	29.14	+7.07	19.67	22.78	+3.11
FLEXIBILITY	10.60	15.67	+5.07	9.76	13.19	+3.43
ORIGINALITY	13.04	28.15	+15.11	9.65	18.83	+9.18

* The N for the Mean Scores on the post-test represent a random sample of those who took the pre-test.

Discussion

It became evident as the experimental design was being implemented that, for several reasons, the research findings would not create unambiguous results.

One of these reasons was the nature of the students in the control group (FEP). The percentage of students who did participate when asked to was small (36%); yet it was a hardy group, interested enough in the project to invest 7-8 hours of its time. Nevertheless, the students probably still did not have the same motivation as the students in MAP who may have been motivated because they either felt doing well on the tests would help the program, or doing well might be in some vague way related to their future chances of getting a time-shortened degree. Despite this, the notion of the comparability of the groups remains viable when one looks at the high academic ability of the control group.

Another issue revolved around the large range of quality of the measuring instruments. While the Watson-Glaser and the "Intellectual Orientations" Inventory were maintained in their standardized form, and had reasonable claims to support their reliability and validity, such is not the case with the other instruments which were viewed as experimental. It would be questionable to rely upon these latter instruments to draw any conclusions about the Images course. One needs to keep this in mind when examining the results.

The answer to the question of "Why did the latter situation occur?" lies mainly in the faculty's enthusiastic desire to be comprehensive in their evaluation efforts. This attempt resulted in either developing new instruments or modifying some already in existence primarily to reduce the amount of time necessary to administer them. And even though time devoted to taking and giving tests was reduced by this procedure, the time necessary to score/code and analyze the student performance became too consuming. (The Torrance Tests taught us that such open-ended tests on a large scale cannot be handled adequately despite wishes to do so.)

While the above should be kept in mind, the basic intent - to provide some objective evidence by which to evaluate the Images course - was achieved to a considerable degree.

The above evidence would suggest that students in the Images course did significantly better on a set of tests intended to measure achievement in the area of critical thinking than did students not in the Images course. Both groups of students made considerable gains in scores on a test of creative thinking, while an inventory used to measure the student's personal intellectual orientation reflected mixed results. Much of this evidence gives rise to further questions, necessitates replication, or leads to further attempts at providing better conditions for such evaluative research to go on.

Appendix I

Teaching Materials

The "Images" faculty divided their readings into two categories - core and stimulus. The core readings were either books focusing on particular types of skills or books which we could agree would be used for a common purpose. In the stimulus category, the individual faculty member was urged to select curricular materials which would either provide opportunities to apply learned skills or supplement the particular emphasis chosen by the instructor.

Core Readings

Edward DeBono, Newthink
Don Fabun, Communications: The Transfer of Meaning
Richard Purtill, Logical Thinking
Charles Reich, The Greening of America

Stimulus Readings

Kenneth Boulding, The Image.
Anthony Burgess, A Clockwork Orange.
Harold Hart, ed., Sexual Latitude.
Darrell Huff, How to Lie with Statistics.
Kevin Lynch, Image of the City.
Donald Riche, ed., The Agitator.
Paul Wolff, In Defense of Anarchism.

Various articles, e.g. Dr. Crane essays (newspapers), organizational newsletters, etc.

Appendix II - Sample Syllabi

Syllabus I

A. Our understanding of perception. (two or four sessions)

1. Lynch: The Image of the City.
   Introduction of the concept of individual perception
   What are the means (both physical and non physical) whereby we perceive
   Perception of the physical environment (using the city as example)

   Fabun: Communications: The Transfer of Meaning
   The process of gathering and transmitting information

2. Discussion based upon Berger's Invitation to Sociology
   Perception of society and intellectual thought
   Basis of one's point of view
   Society in man and man in society

3. Discussion based upon Richardson's Statistics of Deadly Quarrels
   How do we define reality
   Introduction to the use of models

B. Development of the skills of critical thinking and analysis. (six to seven sessions)

1. Ruby: The Art of Making Sense
   Chapters to be assigned before each session and to be briefly discussed at the beginning of class with a few examples of each skill covered.

2. Rice: The Agitator
   Use of a variety of arguments on specific topics to develop the ability to recognize, andalyze and criticize diverse points of view. Expect to use readings from some or all of the following areas:
   a. race relations
   b. national defense
   c. sex education
   d. narcotics
   e. women's liberation

3. Use of, when appropriate, material from current events, particularly local and national politics. Emphasis placed on getting underneath rhetoric.

C. Introduction to Creative Thought Processes (two to four sessions)

1. De Bono: Five Day Course in Thinking
   Awareness and appreciation of the processes involved in thinking
   Introduction and practice of skills related to divergent and convergent thinking and analogy.

D. Assimilation and Application of Skills (four to five sessions)

Combining the ability to perceive, to understand, to evaluate, and to criticize arguments and the ability to create alternative possibilities.

1. Reich: Greening of America
   A book close to the experiences of students

2. Wolf: In Defense of Anarchism
   A rigorous argument regarding a subject which should be unfamiliar to the student

Evening Sessions: will be flexible to allow students to utilize facilities of the campus and Bowling Green. Expect to use some or all of the following
   a. movies (both off and on campus)
   b. speeches (on both academic and non-academic subjects)
   c. television
   d. local politics and civic functions (city council, etc.)

Assignments: Students will be asked to complete two or three outside projects relating to either class material or the evening sessions.

Syllabus II

September	25	Take ORI pre-test; informal get-together in evening.
	26	Take Watson-Glaser pre-test in evening.
	28	Beginning of formal classes; take battery of pre-tests (Torrence, Analogy, Remote Associates)
October	1	Attend Dolci lecture in lieu of Tuesday nite meeting during following week.
	3	Discussion of Dolci lecture in class and of English Life-Style Game. Assign 1st written work based on Life-Style Game to be played that evening.
	3	(evening) Play Life-Style Game.
	5	Some continued discussion of Life-Style activities; Attitudinal lecture on "Man's Place in the Universe."
	10	Reading assignments in Fabun. Class discussion of perception and communications problems.
	10	(evening) Free nite due to previous attendance of Dolci lecture.
	12	Continued discussion on communications, introduction of September '72 Scientific American material on this topic. Assign readings in De Bono.
	17	Class discussion on De Bono's "Lateral Thinking"
	17	(evening) Brainstorming session to create ideas for a play.
	19	Continued discussion of De Bono. Classroom practice with communication and individual perception via a recorded version of "the telephone game."
	24	Classroom attempt to classify ideas generated in previous "Brainstorming" session. Introductory discussions of analysis and classification procedures. Use of another "Brainstorm" session to generate and analyze ideas for grading. Assign written exercise from Fabun or De Bono.
	24	(evening) Combined informational meeting on Humanities Cluster.

	26	Final discussions of De Bono. Comparisons of merits and limitations of lateral and vertical thinking. Considerable class discussion regarding Humanities Cluster.
	31	Written assignment due. Assignments in Purtill. Lecture on first sections of Purtill regarding definitions, classification, and organization.
	31	(evening) Attend simulated political TV debate.
November	2	Class discussions of TV debate. Attempts to analyze merits and deficiencies of each speaker. Continued disucssion regarding Humanities Cluster selection process.
	7	Assignment of paper based on Reich and continued reading in Purtill. Classroom practice on logic problems.
	7	(evening) No meeting due to election returns.
	9	Classroom practice at analyzing weak points in written, argumentative work. Use of George Crane articles from "The Sentinel," and exercises in Purtill.
	14	Study of inductive and deductive logic. Classroom practice with examples in Purtill.
	14	(evening) Personal consultation period to discuss previous written work. (Assignment of October 24)
	21	Reich paper due. Establish class divisions for future research work and debate. Considerable discussion regarding grades. Return of Watson-Glaser pre-test results and discussion of interpretation.
	21	(evening) Begin Thanksgiving holidays.
	28	Class activities based on Induction sections of Purtill. Discussion of strong and weak arguments and generalizations. Considerable discussion regarding logistics of debates and post-tests during final weeks of class.
	28	(evening) Science Cluster informational meeting.
	30	Return Reich themes. Lecture on "The Role of Scientific Thought in an Advanced Society."

December	5	Classroom debates: Mercy killings.
	5	(evening) Classroom debates: Abortion.
	6	(evening) Take OPI post-test.
	7	Classroom debates: Bussing
	8	Battery post-tests (Analogy, Remote Associates, Torrence)
	11	Watson-Glaser post-test and course evaluation form.

Syllabus III

I. Introduction

II. Perception: Do we all see the world in the same manner?

Donald Fabian, Communication: The Transfer of Meaning

Lionel Ruby, Chapters 1-4

III. Conflict: How can we choose from the contrasting and conflicting sources of information?

Advocates: Censorship of the Press

Sexual Latitude: For and Against
- Herliky, p. 10
- Babbage, p. 22
- Dickson, p. 38
- Ellis, p. 66
- Packard, p. 84
- Wallach, p. 104
- Brown, p. 124

Ruby, Chapters 5-7

Advocates: Legalization of Prostitution

IV. Further Study of the Tools for Decision-Making: Who should I believe?

Darrell Huff, How to Lie With Statistics

Donald Ricem editor, Agitator
- Madole, "America at the Crossroads: Authoritarianism or Chaos," p. 34.
- Woodworth, "The Case for Anarchism," p. 44.
- Hazlitt, "In Defense of Conformity," p. 46.
- Munn, "What Being an American Should Mean," p. 62.

Ruby, Chapters 9, 11

Rice: Agitator
- Munn, "Compare the Results," p. 170.
- Young, "Hoax of Marxist Economics," p. 161.
- Manis, "Poverty: "A Libertarian View," p. 195.
- Dan Smoot Report, "Our Tax Money Breeds Misery," p. 199.
- Johnson, "Welfare and the Constitution," p. 207.
- Siegal, "Lessons from the Summer Work-In," p. 209.

Ruby, Chapters 14-15

V. Understanding the Source: What are the causes?

Rice: Agitator
Stevenson, "No Justice for Black People," p. 250.
The New Right, "White Reply to the Black Manifesto," p. 254.
Christian Anti-Communist Crusade, "Are the Black Panthers Being Prosecuted," p. 257.
Hillegas, "Mendenhall: Old-Time Violence,: p. 261.
Anderson, "Straight Talk," p. 284.
Duke, "The White Power Program," p. 288.

Advocates: Bussing

Ruby, Chapter 18

VI. Importance of Assumptions and Values

Rice: Agitator
Marra, "The Case Against Sex Education in the Schools, p. 379.
Hoppe, "The Latest Book in Sex Education," p. 387.

Advocates: Euthanasia

Ruby, Chapters 19-20

Charles Reich, The Greening of America